Remarks

The Final Office Action mailed 12 April 2002 has been received and reviewed. Claims 22, 29-31, 33, 39, 47, and 49-51 having been amended, the pending claims are claims 1, 5, 10-14, 16, 18, 19, 21-35, 39, and 41-52.

Claims 29-31 have been amended to overcome the Examiner's rejection under 35 U.S.C 112, second paragraph. Claims 22, 33, 39, 47, and 49-51 have been amended to recite membrane pore sizes as disclosed in the specification at page 11, lines 13-14.

No new matter has been added as a result of these amendments.

Reconsideration and withdrawal of the rejections in view of the foregoing amendments and the following comments are respectfully requested.

The 35 U.S.C. §112, First Paragraph Rejection

The Examiner rejected claims 46-49 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the Examiner stated that the application as originally filed does not support the pore size limitation set forth in claims 46-49.

Applicants respectfully assert that claims 46 and 48, as previously submitted, and claims 47 and 49, as currently amended, are fully supported by the specification. In particular, the pore sizes of at least 0.4 micron (as recited in claims 46 and 48) and no greater than 2 microns (as recited in claims 47 and 49) are fully supported in the specification at page 11, lines 13-14. Applicants' Representatives apologize for the inadvertent error with respect to claims 47 and 49, which recited a thickness rather than pore size.

Applicants, therefore, respectfully request reconsideration and withdrawal of this rejection.

The 35 U.S.C. §112, Second Paragraph Rejection

The Examiner rejected claims 29-31 and 46-49 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicants regard as the invention.

Applicants respectfully assert that the amendments made to claims 29-31 render the rejection as to these claims moot.

Further, Applicants respectfully traverse the rejection of claims 46-49 regarding ranges of pore sizes. It is respectfully pointed out that 112, second paragraph, merely requires that the claims particularly point out the subject matter which Applicants' regard as the invention, and that the scope of the claims are clear to one of ordinary skill in the art. The fact that the claims do not include an upper limit for the pore size does not make them unclear. As discussed in greater detail below, the minimum pore size is important for defining certain aspects and advantages of the invention; however, there is teaching in the specification that the upper pore size is required to define the invention.

However, claims 47 and 49, which are dependent from claims 46 and 48, respectively, have been amended to recite an upper limit for the pore size.

Applicants, therefore, respectfully request reconsideration and withdrawal of this rejection.

The 35 U.S.C. §103, Rejections

The Examiner rejected claims 22, 25-28, 32-35, and 48-52 under 35 U.S.C. §103(a) as being unpatentable over Malhotra et al. (U.S. Patent No. 5,500,668) in view of Carreira et al. (U.S. Patent No. 5,220,346).

The Examiner rejected claims 29-31, 39, 44, and 45 under 35 U.S.C. §103(a) as being unpatentable over Malhotra et al. (U.S. Patent No. 5,500,668) in view of Carreira et al.

(U.S. Patent No. 5,220,346) as applied to claims 22, 25-28, 32-35, and 48-52, and further in view of Kojima et al. (U.S. Patent No. 5,667,067).

Applicants respectfully traverse these rejections.

Although Malhotra et al. disclose recording sheets including a substrate and a salt, wherein the salt may include a multivalent metal salt, there is no teaching or suggestion whatsoever of the selection of the combination of a multivalent metal salt and surfactant, as claimed by Applicants, that provides pigment management and fluid management on porous substrates having a pore size of at least 0.2 micron.

Malhotra et al. disclose a recording sheet that may include a salt chosen from a list of a myriad of possible salts (Malhotra et al., column 12, line 47 to column 18, line 39), only some of which include multivalent metal cations (Malhotra et al., column 12, lines 49-57). Furthermore, "[A]ny suitable substrate can be employed." (Malhotra et al., column 11, lines 29-30). "Optionally, the coating of the recording sheet [of Malhotra et al.] can also contain betaine." (Malhotra et al., column 25, lines 1-2). There is absolutely no teaching or suggestion of the specific combination of a multivalent metal salt, selected from the long list of possible salts disclosed by Malhotra et al., many of which are not multivalent, combined with a surfactant to provide pigment management and fluid management on the porous substrates of the invention, wherein the pores of the porous substrate have a pore size that is at least 0.2 μm.

Applicants have specifically identified and selected the combination of multivalent metal salt and surfactant that provides pigment management and fluid management on a porous substrate (claim 39), on a porous membrane of a synthetic polymer (claims 22 and 33), and a thermally induced phase separated microporous membrane of a synthetic polymer (claims 50 and 51), wherein the pore sizes of the membranes and substrates are at least 0.2 μm (Specification, page 11, lines 13-14). Applicants have discovered that poor quality images result when printing with pigmented inks on a thermally induced phase separated microporous membrane (Declaration of Clinton P. Waller, Jr., filed December 21, 2001, page 1, paragraph 3

and page 3, paragraph 7). These membranes typically have pore sizes of about 0.65 μm (Declaration of Clinton P. Waller Jr., page 1, paragraph 3 and Applicant's Specification, page 11, line 28 to page 12, line 4). Applicants have specifically selected a combination of a multivalent metal salt and a surfactant that provides pigment management and fluid management on the porous substrates of the invention having pore sizes of at least 0.2 μm.

Teslin, available from PPG Industries, is disclosed in Malhotra et al. (column 11, line 50-51) as a possible substrate. However, Teslin is a distinct material from the preferred porous substrates of the present invention. Pore sizes of the preferred membranes are typically at least 0.2 μm, which is recited in claims 22, 33, 39, 50, and 51, and preferably at least 0.4 μm, which is recited in claims 46 and 48 (Specification, page 11, lines 13-14). Preferably the pore sizes are no greater than about 2 μm (Specification, page 11, line 13). Teslin, on the other hand, typically has a pore size that is smaller (less than about 0.138 μm[1]) than the preferred membranes of the present invention. As recognized in the Declaration of Clinton P. Waller, Jr., membranes that typically have larger pore sizes than Teslin substrates tend to produce poor quality images when printed with pigmented inks (Declaration, page 1, paragraph 3 and page 3, paragraph 7). It is this problem of printing with pigmented inks on the larger pore substrates that Applicants have recognized and solved.

The Examiner stated in the present Office Action at page 8, lines 7-9 that the proffered evidence does not demonstrate that Malhotra's recording sheets are necessarily not suitable for use with pigmented-based inks. Applicants respectfully submit, however, that Applicants are not required to demonstrate this. Applicants submit that Malhotra et al. fail to teach or suggest Applicants' invention because although Malhotra et al. disclose an extensive list of possible salts and substrates for use as recording sheets, Malhotra et al. not only fail to

1 Applicant Clinton P. Waller, Jr., performed a bubble point measurement of three samples of Teslin of varying thickness according to ASTM F-316, as described in the specification at page 11, lines 11-13, and determined pore sizes of the Teslin samples to be 0.138 μm, 0.135 μm, and 0.125 μm. Additionally, Applicant was informed by a representative of PPG Industries, Inc., that all grades of Teslin sheets currently available have pore sizes of about 0.1 μm or smaller. This information is provided for the Examiner's convenience. However, if the Examiner believes

recognize the advantage of the combination of multivalent metal salt and surfactant of the present invention, but also fail to recognize the problem of printing on larger pore membranes. Applicants have not only recognized the problem (Declaration of Clinton P. Waller Jr., page 1, paragraph 3 and page 3, paragraph 7), but have also solved the problem with the selection of the specific combination of a multivalent metal salt and a surfactant of the present invention.

Although Malhotra et al. disclose recording sheets which can include multivalent metal salts and a Teslin substrate, optionally including betaine, "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988). Applicants respectfully submit that the combination of Malhotra et al. with Carreira et al., and further with Kojima et al. as cited by the Examiner can only occur by the impermissible use of hindsight reasoning. Malhotra et al. do not recognize the advantage of the specific selection of the combination of a multivalent metal salt and a surfactant to provide pigment management and fluid management on porous substrates. Further, neither Carreira et al. nor Kojima et al. recognize the advantage of Applicants' combination of a multivalent metal salt and a surfactant either. Thus neither document provides that which is missing from Malhotra et al.

As Malhotra et al., taken alone or with either or both Carreira et al. or Kojima et al. neither teach nor suggest the present invention as claimed, Applicants respectfully request reconsideration and withdrawal of the rejections.

Summary

It is respectfully submitted that the pending claims 1, 5, 10-14, 16, 18, 19, 21-35, 39, and 41-52 are in condition for allowance and notification to that effect is respectfully requested.

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it is necessary to do so, a Declaration under 37 C.F.R. §1.132 can be provided.

The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
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CERTIFICATE UNDER 37 CFR §1.8:
The undersigned hereby certifies that this paper is being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Assistant Commissioner for Patents, Washington, D.C. 20231, on this 12TH day of July, 2002, at 8:25 pm (Central Time).

By: Kathleen Franklin
Name: KATHLEEN FRANKLIN

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APPENDIX A - SPECIFICATION/CLAIM AMENDMENTS INCLUDING NOTATIONS TO INDICATE CHANGES MADE
Serial No.: 08/892,902
Docket No.: 53473US002

Amendments to the following are indicated by underlining what has been added and bracketing what has been deleted. Additionally, all amendments have been marked in bold.

In the Claims

For convenience, all pending claims are shown below.

1. (ALLOWED) An inkjet receptor medium comprising:

a porous substrate having a fluid management system and a pigment management system in contact with surfaces of pores of the substrate, wherein the pigment management system comprises functionalized particulates within the pores of the porous substrate and the fluid management system comprises a surfactant.

5. (ALLOWED) The medium of Claim 1, wherein the functionalized particulates comprise fluorinated silica agglomerates that interact with dispersant to agglomerate pigment particles as an ink containing the pigment particles passes through pores.

10. (ALLOWED) The medium according to Claim 21, wherein the microporous membrane comprises a polypropylene film co-extruded with a mineral oil followed by bi-axial stretching under thermal conditions.

11. (ALLOWED) The medium according to claim 10, wherein the microporous membrane is an opaque film.

12. (ALLOWED) The medium according to Claim 1, wherein the surfactant is selected from the group consisting of fluorocarbon, silicon, hydrocarbon-based surfactants or a mixture thereof.

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13. (ALLOWED) The medium according to Claim 12, wherein the surfactant comprises a silicon-based non-ionic surfactant.

14. (ALLOWED) The medium according to Claim 12, wherein the surfactant comprises a hydrocarbon surfactant of a fatty acid.

16. (ALLOWED) A method of making an inkjet receptor medium comprising:

(a) preparing a pigment management system;

(b) imbibing the pigment management system into pores of a porous substrate, wherein the pigment management system once imbibed into the pores comprises functionalized particulates within the pores of the porous substrate; and

(c) imbibing a fluid management system into the pores of the porous substrate wherein the fluid management system comprises a surfactant.

18. (ALLOWED) A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 1 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink, wherein the inkjet ink comprises pigment particles.

19. (ALLOWED) The method according to Claim 18, wherein the inkjet ink further comprises a dispersant.

21. (ALLOWED) The medium according to claim 1, wherein the porous substrate comprises a microporous membrane.

22. (AMENDED) An inkjet receptor medium comprising:

a porous membrane of a synthetic polymer having a fluid management system and a pigment management system in contact with surfaces of pores of the substrate, wherein the pigment management system comprises a multivalent metal salt coating along the surfaces of the porous substrate, **[and]** wherein the fluid management system comprises a surfactant, **and further wherein the size of the pores of the porous membrane is at least 0.2 μm**.

23. (ALLOWED) The medium of claim 1, wherein the functionalized particulates comprise fluorinated silica agglomerates.

24. (ALLOWED) An inkjet receptor medium comprising:

a porous substrate having a fluid management system and a pigment management system in contact with surfaces of pores of the substrate wherein the pigment management system comprises fluorinated silica agglomerates that are capable of agglomerating pigment particles in a pigment-containing ink used to print the inkjet receptor medium.

25. The medium according to Claim 22, wherein the multivalent metal salt coating comprises a multivalent salt of cations derived from the elements of Group II and above in the Periodic Table within conditions of solubility rules, wherein the salt comprises a single salt or a binary salt or a ternary salt containing counterions selected from the group consisting of nitrate, nitrite, sulfate, sulfite, bisulfite, alkanesulfonate, fluoroalkanesulfonates, perchlorate, halide, pseudo-halides, acetate, propionate, and combinations thereof.

26. The medium according to Claim 22, wherein the porous membrane comprises a microporous membrane.

27. The medium according to Claim 26, wherein the microporous membrane comprises a polypropylene film co-extruded with a mineral oil followed by bi-axial stretching under thermal conditions.

28. The medium according to Claim 26, wherein the microporous membrane is a phase separated membrane.

29. (AMENDED) The medium according to Claim 22, wherein the **[anionic]** surfactant is selected from the group consisting of fluorocarbon, silicon, hydrocarbon-based surfactants or a mixture thereof.

30. (AMENDED) The medium according to Claim 22, further comprising **an additional surfactant, wherein the additional surfactant** is a silicon-based non-ionic surfactant.

31. (AMENDED) The medium according to Claim 29, wherein the **[anionic]** surfactant comprises a hydrocarbon surfactant of a fatty acid.

32. The medium of claim 22 wherein the porous membrane of a synthetic polymer is a thermally induced phase separated microporous membrane.

33. (AMENDED) A method of making an inkjet receptor medium comprising:

(a) preparing a pigment management system;

(b) imbibing the pigment management system into pores of a porous membrane of a synthetic polymer, wherein the pigment management system once imbibed into pores of the porous membrane comprises a multivalent metal salt coating along the surfaces of the pores of

the porous substrate; and

(c) imbibing a fluid management system into the pores of the porous membrane wherein the fluid management system comprises a surfactant, **and further wherein the size of the pores of the porous membrane is at least 0.2 µm** .

34. A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 22 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink, wherein the inkjet ink comprises pigment particles.

35. The method according to Claim 34, wherein the inkjet ink further comprises a dispersant.

39. (AMENDED) An inkjet receptor medium comprising a porous substrate comprising a multivalent metal salt coating and an anionic surfactant in contact with surfaces of pores of the porous substrate, and further comprising a pigmented ink image thereon, **wherein the size of the pores of the porous substrate is at least 0.2 µm**.

41. (ALLOWED) An inkjet receptor medium comprising a porous substrate comprising fluorinated silica agglomerates in contact with surfaces of pores of the porous substrate.

42. (ALLOWED) The inkjet receptor medium of Claim 41 further comprising a pigmented ink image thereon.

43. (ALLOWED) A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 1 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink.

44. The inkjet receptor medium of Claim 22, wherein the surfactant is an anionic surfactant.

45. The method of Claim 33, wherein the surfactant is an anionic surfactant.

46. The inkjet receptor medium of Claim 1, wherein the size of the pores of the porous substrate are about 0.4μ or greater.

47. (AMENDED) The inkjet receptor medium of Claim **[1]** **46**, wherein the size of the pores of the porous substrate **is no greater than about 2 μm** **[are about 0.75μ or greater]**.

48. The inkjet receptor medium of Claim 22, wherein the size of the pores of the porous substrate are about 0.4μ or greater.

49. (AMENDED) The inkjet receptor medium of Claim **[22]** **48**, wherein the size of the pores of the porous substrate **is no greater than about 2 μm** **[are about 0.75μ or greater]**.

50. (AMENDED) An inkjet receptor medium comprising:

a thermally induced phase separated microporous membrane of a synthetic polymer having a fluid management system and a pigment management system in contact with the surfaces of pores of the substrate, wherein the pigment management system comprises a multivalent metal salt coating along the surfaces of the microporous substrate, **[and]** wherein the fluid management system comprises a surfactant, **and further wherein the size of the pores of the microporous membrane is at least 0.2 μm**.

51. (AMENDED) A method of making an inkjet receptor medium comprising:

(a) preparing a pigment management system;

(b) imbibing the pigment management system into pores of a thermally induced phase separated microporous membrane of a synthetic polymer, wherein the pigment management system once imbibed into pores of the microporous membrane comprises a multivalent metal salt coating along the surfaces of the pores of the microporous substrate; and

(a) imbibing a fluid management system into the pores of the microporous membrane wherein the fluid management system comprises a surfactant, **and further wherein the size of the pores of the microporous membrane is at least 0.2 μm**.

52. A method of using an inkjet receptor medium comprising:

(a) placing an inkjet receptor medium of claim 22 in an inkjet printer; and

(b) printing an image on the medium using inkjet ink.

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